

### **Amendments to the Claims:**

This listing of claims will replace all prior versions and listings of claims in the application:

#### **Listing of Claims**

1. (Cancelled) An improved method of processing corn plants with a corn head row unit comprising the steps of:
  - a. engaging the corn plant with a plurality of stalk rolls,
  - b. pinching the corn plant between said stalk rolls,
  - c. pulling the corn plant stalk down with said stalk rolls,
  - d. separating said ear of corn from the corn plant stalk,
  - e. engaging said ear of corn with at least one gathering chain paddle,
  - f. having the speed of said stalk rolls and gathering chain paddles fixed during operation;
  - g. wherein the velocity of said gathering chain paddle creates minimal stalk shear; and,
  - h. wherein the maximum ear separation substantially vertical velocity creates minimal damage to the ear of corn upon impact with the stripper plates.
2. (Cancelled) An improved arrangement of a corn head row unit comprising:
  - a. a source of power for rotation,
  - b. at least one stalk roll for engagement with a corn plant stalk,
  - c. said stalk roll having at least one flute,
  - d. a stripper plate,
  - e. at least one gathering chain having paddles,
  - f. a gearbox fixing the speed of said gathering chain paddles and said stalk roll flute during operation,
  - g. wherein the gearbox ratio is selected to create minimal stalk shear; and,

- h. wherein the resulting maximum ear separation velocity creates minimal damage to the ear of corn upon impact with the stripper plates.
3. (Cancelled) An improved arrangement of a corn head row unit according to claim 2 having two opposing stalk rolls for engagement with a corn plant stalk.
  4. (Cancelled) An improved arrangement of a corn head row unit according to claim 2 wherein said stalk rolls have an enlarged length to minimize stalk shear.
  5. (Cancelled) An improved arrangement of a corn head row unit according to claim 2 wherein said gathering chain drive sprocket size has been reduced to minimize stalk shear.
  6. (Cancelled) An improved arrangement of a corn head row unit according to claim 2 wherein said stalk roll diameter has been increased to minimize stalk shear.
  7. (Cancelled) An improved arrangement of a corn head row unit according to claim 3 wherein said stalk rolls have an enlarged length to minimize stalk shear.
  8. (Cancelled) An improved arrangement of a corn head row unit according to claim 3 wherein said gathering chain drive sprocket size has been reduced to minimize stalk shear.
  9. (Cancelled) An improved arrangement of a corn head row unit according to claim 3 wherein said stalk roll diameter has been increased to minimize stalk shear.
  10. (Cancelled) An improved arrangement of a corn head row unit according to claims 7, 8, or 9 wherein said row unit has a shear point with a rounded edge.
  11. (Cancelled) An improved method of processing corn plants with a corn head row unit comprising the steps of:
    - a. engaging the corn plant with a plurality of rotational elements,
    - b. pinching the corn plant between said rotational elements,
    - c. pulling the corn plant stalk down with said rotational elements,

- d. separating said ear of corn from the corn plant stalk,
  - e. engaging said ear of corn with at least one horizontal element,
  - f. said horizontal element substantially moving only ears of corn for collection and further processing within the threshing unit of a combine,
  - g. wherein the velocity of said horizontal element minimizes the occurrence of corn plant stalk separation due to corn plant stalk movement restrictions created by said rotational and horizontal elements; and,
  - h. wherein the speed of said rotational and horizontal elements is fixed during operation.
12. (Cancelled) An improved arrangement of a corn head row unit comprising:
- a. a source of power for rotation,
  - b. at least one stalk roll for engagement with a corn plant stalk,
  - c. said stalk roll having at least one flute,
  - d. a stripper plate,
  - e. at least one gathering chain having paddles,
  - f. a gearbox fixing the speed of said gathering chain paddles and said stalk roll flute during operation,
  - g. wherein the gearbox ratio is selected to produce a gathering chain paddle velocity which minimizes the occurrence of corn plant stalk separation due to corn plant stalk movement restrictions created by said stalk rolls and gathering chain paddles; and,
  - h. wherein the resulting maximum ear separation velocity creates minimal damage to the ear of corn upon impact with the stripper plates.
13. (Cancelled) An improved arrangement of a corn head row unit according to claim 12 having two opposing stalk rolls for engagement with a corn plant stalk.

14. (Cancelled) An improved arrangement of a corn head row unit according to claim 12 wherein said stalk rolls have an enlarged length to minimize stalk shear.
15. (Cancelled) An improved arrangement of a corn head row unit according to claim 12 wherein said gathering chain drive sprocket size has been reduced to minimize stalk shear.
16. (Cancelled) An improved arrangement of a corn head row unit according to claim 12 wherein said stalk roll diameter has been increased to minimize stalk shear.
17. (Cancelled) An improved arrangement of a corn head row unit according to claim 13 wherein said stalk rolls have an enlarged length to minimize stalk shear.
18. (Cancelled) An improved arrangement of a corn head row unit according to claim 13 wherein said gathering chain drive sprocket size has been reduced to minimize stalk shear.
19. (Cancelled) An improved arrangement of a corn head row unit according to claim 13 wherein said stalk roll diameter has been increased to minimize stalk shear.
20. (Cancelled) An improved arrangement of a corn head row unit according to claims 17, 18 or 19 wherein said row unit has a shear point with a rounded edge.
21. (Cancelled) An improved arrangement of a corn head row unit according to claim 20 wherein said shear point is removable allowing for replacement.
22. (Cancelled) An improved arrangement of a corn head row unit comprising:
  - a. means for engaging a corn plant with a plurality of rotational elements,
  - b. means for pinching a corn plant between said rotational elements,
  - c. means for pulling the corn plant stalk down with said rotational elements,
  - d. means for separating the corn plant ear from the corn plant stalk,
  - e. wherein the maximum ear velocity allowed creates minimal damage to the ear of corn upon impact with said separation means,

- f. means for engaging an ear of corn for horizontal movement to an ear collection means and further processing within the threshing unit of a combine,
  - g. wherein the maximum velocity of said means for engaging an ear of corn for horizontal movement creates minimal stalk shear; and,
  - h. a power source for said engaging, pinching, pulling and horizontal movement means wherein the speed of said means is fixed during operation.
23. (Cancelled) A combination of cooperating elements offered as a kit for improved operation of a single corn head row unit comprising:
- a. a gathering chain drive sprocket having a reduced size to minimize stalk shear; and
  - b. at least one gathering chain.
24. (Cancelled) The combination of cooperating elements offered as a kit according to claim 23 also including enlarged gathering chain paddles for attachment to at least one gathering chain.
25. (Cancelled) The combination of cooperating elements offered as a kit according to claim 23 also including a second gathering chain.
26. (Cancelled) The combination of cooperating elements offered as a kit according to claim 23 also including a set of stripper plates.
27. (Cancelled) The combination of cooperating elements offered as a kit according to claim 23 also including a set of stalk rolls.
28. (Cancelled) The combination of cooperating elements offered as a kit according to claim 23 wherein the gathering chain drive sprocket has five teeth.
29. (Cancelled) The combination of cooperating elements offered as a kit according to claim 23 wherein the gathering chain drive sprocket has eight teeth.

30. (Cancelled) A combination of cooperating elements offered as a kit to minimize stalk shear for a single corn head row unit comprising:
- a. a gathering chain drive sprocket size having a reduced size to minimize stalk shear;
  - b. at least one gathering chain;
  - c. at least one stripper plate; and,
  - d. at least one stalk roll.
31. (Cancelled) The combination of cooperating elements offered as a kit according to claim 29 also including enlarged gathering chain paddles for attachment to at least one gathering chain.
32. (Cancelled) A combination of cooperating elements offered as a kit to minimize stalk shear for a single corn head row unit comprising:
- a. a gathering chain drive sprocket size having a reduced size to minimize stalk shear;
  - b. a set of gathering chains;
  - c. a set of stripper plates; and,
  - d. a set of stalk rolls.
33. (Cancelled) The combination of cooperating elements offered as a kit according to claim 31 also including enlarged gathering chain paddles for attachment to at least one gathering chain.
34. (Cancelled) The combination of cooperating elements offered as a kit according to claim 31 or 32 wherein the gathering chain drive sprocket has five teeth.
35. (Cancelled) The combination of cooperating elements offered as a kit according to claim 32 wherein the gathering chain drive sprocket has eight teeth.

36. (Cancelled) An improved method of processing corn plants with a corn head row unit comprising the steps of:
- a. engaging the corn plant with a plurality of stalk rolls,
  - b. pinching the corn plant between said stalk rolls,
  - c. pulling the corn plant stalk down with said stalk rolls,
  - d. separating said ear of corn from the corn plant stalk,
  - e. engaging said ear of corn with at least one gathering chain paddle,
  - f. having the speed of said stalk rolls and gathering chain paddles fixed during operation;
- and,
- g. minimizing stalk shear created by contact between the gathering chain paddle and the corn stalk by using a powered gathering chain drive sprocket having eight (8) teeth in combination with a gathering chain sprocket having ten (10) teeth.
37. (Cancelled) An improved method of processing corn plants with a corn head row unit comprising the steps of:
- a. engaging the corn plant with a plurality of stalk rolls,
  - b. pinching the corn plant between said stalk rolls,
  - c. pulling the corn plant stalk down with said stalk rolls,
  - d. separating said ear of corn from the corn plant stalk,
  - e. engaging said ear of corn with at least one gathering chain paddle,
  - f. having the speed of said stalk rolls and gathering chain paddles fixed during operation;
- and,

- g. minimizing stalk shear created by contact between the gathering chain paddle and the corn stalk by using a powered gathering chain drive sprocket having five (5) teeth in combination with a gathering chain sprocket having eight (8) teeth.
38. (Cancelled) An improved arrangement of a corn head row unit comprising:
- a. a source of power for rotation;
  - b. at least one stalk roll for engagement with a corn plant having at least one ear of corn;
  - c. said at least one stalk roll having at least one flute;
  - d. at least one stripper plate arranged above said at least one stalk roll;
  - e. at least one gathering chain having a plurality of paddles affixed thereto, wherein said at least one gathering chain cooperates with a first and second sprocket and wherein said first sprocket is a drive sprocket and said second sprocket is a coast sprocket; and,
  - f. a gearbox fixing the rotational speed of said gathering chain drive sprocket and the rotational speed of said at least one stalk roll flute during operation, wherein the rate at which said corn plant is vertically (with respect to said corn head row unit) consumed by said at least one stalk roll is defined as the ear separation vertical velocity, wherein the resulting ear separation vertical velocity is selected from 6 to 13 miles per hour for minimal damage to said at least one ear of corn upon impact with said at least one stripper plate and wherein a dimensionless quantity  $\alpha$  is defined as the ear separation vertical velocity divided by the linear horizontal (with respect to said corn head row unit) velocity of said plurality of gathering chain paddles, and wherein  $\alpha$  is greater than 3.05 to minimize stalk shear.
39. (Cancelled) The improved arrangement of a corn head row unit as set forth in claim 38 having two opposing stalk rolls for engagement with said corn plant.



40. (Cancelled) The improved arrangement of a corn head row unit as set forth in claim 38 wherein the length of said at least one stalk roll has been selected to increase the horizontal distance said corn plant is able to travel before said corn plant is exposed to a shearing position so that the amount of said corn plant vertically consumed by said at least one stalk roll per length of said at least one stalk roll is set so that substantially all of said at least one ear(s) of corn impact said at least one stripper plate prior to shearing of said corn plant to minimize stalk shear.
41. (Cancelled) The improved arrangement of a corn head row unit as set forth in claim 38 wherein the size of said gathering chain drive sprocket size has been selected to decrease the linear horizontal speed of said plurality of gathering chain paddles to increase the dimensionless quantity  $\alpha$  to a value greater than 3.05 to minimize stalk shear.
42. (Cancelled) The improved arrangement of a corn head row unit as set forth in claim 41 wherein said gathering chain drive sprocket has less than 8 teeth and said coast sprocket has 8 or more teeth.
43. (Cancelled) The improved arrangement of a corn head row unit as set forth in claim 41 wherein said gathering chain drive sprocket has less than 10 teeth and said coast sprocket has 10 or more teeth.
44. (Cancelled) The improved arrangement of a corn head row unit as set forth in claim 38 wherein the diameter of said at least one stalk roll has been selected to increase  $\alpha$  to a value greater than 3.05 to minimize stalk shear.
45. (Cancelled) The improved arrangement of a corn head row unit as set forth in claim 44 wherein the diameter of said at least one stalk roll is in the range of 3.5-5.0 inches.

46. (Cancelled) The improved arrangement of a corn head row unit as set forth in claim 39 wherein the length of said stalk rolls has been selected to increase the horizontal distance said corn plant is able to travel before said corn plant is exposed to a shearing position so that the amount of said corn plant vertically consumed by said stalk rolls per length of said stalk rolls is set so that substantially all of said at least one ear(s) of corn impact said stripper plates prior to shearing of said corn plant to minimize stalk shear.
47. (Cancelled) The improved arrangement of a corn head row unit as set forth in claim 46 wherein the length of said stalk rolls is greater than twenty-two inches.
48. (Cancelled) The improved arrangement of a corn head row unit as set forth in claim 39 wherein the size of said gathering chain drive sprocket size has been selected to decrease the linear horizontal speed of said plurality of gathering chain paddles to increase the dimensionless quantity  $\alpha$  to a value greater than 3.05 to minimize stalk shear.
49. (Cancelled) The improved arrangement of a corn head row unit as set forth in claim 48 wherein said gathering chain drive sprocket has less than 8 teeth and said coast sprocket has 8 or more teeth.
50. (Cancelled) The improved arrangement of a corn head row unit as set forth in claim 48 wherein said gathering chain drive sprocket has less than 10 teeth and said coast sprocket has 10 or more teeth.
51. (Cancelled) The improved arrangement of a corn head row unit as set forth in claim 39 wherein the diameter of said at least one stalk roll has been selected to increase  $\alpha$  to a value greater than 3.05 to minimize stalk shear.
52. (Cancelled) The improved arrangement of a corn head row unit as set forth in claim 51 wherein the diameter of said at least one stalk roll is in the range of 3.5-5.0 inches.

53. (Cancelled) An improved arrangement of a corn head row unit as set forth in claim 38 wherein said corn head row unit has a shear point with a rounded edge.
54. (Cancelled) An improved arrangement of a corn head row unit as set forth in claim 39 wherein said corn head row unit has a shear point with a rounded edge.
55. (Cancelled) The improved arrangement of a corn head row unit as set forth in claim 53 wherein said shear point is removable allowing for replacement.
56. (Cancelled) The improved arrangement of a corn head row unit as set forth in claim 54 wherein said shear point is removable allowing for replacement.
57. (Cancelled) The improved arrangement of a corn head row unit as set forth in claim 38 wherein the internal gearing of said gear box has been selected so that  $\alpha$  is greater than 3.05 to minimize stalk shear.
58. (Cancelled) The improved arrangement of a corn head row unit as set forth in claim 39 wherein the internal gearing of said gear box has been selected so that  $\alpha$  is greater than 3.05 to minimize stalk shear.
59. (Cancelled) The improved arrangement of a corn head row unit as set forth in claim 38 wherein the combination of internal gearing of said gear box, the diameter of said at least one stalk roll and the size of said gathering chain drive sprocket are selected to produce an  $\alpha$  greater than 3.05 to minimize stalk shear.
60. (Cancelled) The improved arrangement of a corn head row unit as set forth in claim 39 wherein the combination of internal gearing of said gear box, the diameter of said stalk rolls and the size of said gathering chain drive sprockets are selected to produce an  $\alpha$  greater than 3.05 to minimize stalk shear.
61. (Cancelled) An improved arrangement of a corn head row unit comprising:

- a. an engaging means for engaging a corn plant with a plurality of rotational elements;
  - b. a pinching means for pinching said corn plant between said plurality of rotational elements;
  - c. a pulling means for pulling said corn plant down with said plurality of rotational elements;
  - d. a separation means for separating an ear of corn from said corn plant, wherein the rate at which said corn plant is vertically (with respect to the corn head row unit) consumed by said plurality of rotational elements is between 6 and 13 miles per hour for minimal damage to said ear of corn upon impact with said separation means;
  - e. a horizontal movement means for engaging said ear of corn for horizontal (with respect to said corn head row unit) movement to an ear collection means and further processing within the threshing unit of a harvesting processor; and,
  - f. a power source for said engaging, pinching, pulling and horizontal movement means wherein the relative speed of said engaging, pinching, pulling and horizontal movement means is fixed during operation and wherein the speed of linear vertical consumption of said corn plant by pulling means divided by the linear speed of said horizontal movement means is greater than 3.05.
62. (Cancelled) An improved arrangement of a corn head row unit comprising:
- g. a source of power for rotation;
  - h. at least one stalk roll for engagement with a corn plant stalk;
  - i. at least one flute affixed to said at least one stalk roll wherein said at least one flute protrudes radially from said at least one stalk roll and extends along an axial portion of

- j. at least one stripper plate arranged above said at least one stalk roll;
  - k. at least one gathering chain having a plurality of paddles affixed thereto, wherein said at least one gathering chain cooperates with a first and second sprocket and wherein said first sprocket is a drive sprocket and said second sprocket is a coast sprocket;
  - l. a gearbox fixing the rotational speed of said gathering chain drive sprocket and the rotational speed of said at least one stalk roll during operation, wherein a rate at which said corn plant stalk is vertically (with respect to said corn head row unit) consumed by said at least one stalk roll is defined as the ear separation vertical velocity, wherein said resulting ear separation vertical velocity is selected from 6 to 13 miles per hour for minimal damage to an ear of corn upon impact with said at least one stripper plate; and,
  - m. wherein a distance said at least one flute radially extends from said at least one stalk roll, a diameter of said at least one stalk roll, a size of said gathering chain drive sprocket, said gearbox, and the length of said exposed fluted area are chosen so that at least one stalk roll is capable of consuming at least sixty inches of a corn plant stalk during the travel of one of said plurality of paddles along said exposed fluted area.
63. (Cancelled) The improved arrangement of a corn head row unit as set forth in claim 62 further defined as having two opposing stalk rolls for engagement with said corn plant stalk.
64. (Cancelled) The improved arrangement of a corn head row unit as set forth in claim 62 wherein the length of said exposed fluted area has been selected to increase the horizontal distance said corn plant is able to travel before said corn plant is exposed to a shearing position so that the amount of said corn plant stalk vertically consumed by said at least one

stalk roll per length of said exposed fluted area is arranged so that substantially all ears of corn connected to said corn plant impact said at least one stripper plate prior to shearing of said corn plant to minimize stalk shear.

65. (Cancelled) The improved arrangement of a corn head row unit as set forth in claim 62 wherein the size of said gathering chain drive sprocket size has been selected to decrease the linear horizontal speed of said plurality of paddles.
66. (Cancelled) The improved arrangement of a corn head row unit as set forth in claim 65 wherein said gathering chain drive sprocket has less than eight teeth and said coast sprocket has eight or more teeth.
67. (Cancelled) The improved arrangement of a corn head row unit as set forth in claim 65 wherein said gathering chain drive sprocket has less than ten teeth and said coast sprocket has eight or more teeth.
68. (Cancelled) The improved arrangement of a corn head row unit as set forth in claim 62 wherein said diameter of said at least one stalk roll has been selected to be in the range of three and one half to five inches.
69. (Cancelled) The improved arrangement of a corn head row unit as set forth in claim 62 wherein said distance said at least one flute radially extends from said at least one stalk roll has been selected to be in the range of one-sixteenth of an inch to two inches.
70. (Cancelled) The improved arrangement of a corn head row unit as set forth in claim 63 wherein the length of said exposed fluted area has been selected to increase the horizontal distance said corn plant is able to travel before said corn plant is exposed to a shearing position so that the amount of said corn plant stalk vertically consumed by said at least one stalk roll per length of said exposed fluted area is arranged so that substantially all ears of

corn connected to said corn plant impact said at least one stripper plate prior to shearing of said corn plant to minimize stalk shear.

71. (Cancelled) The improved arrangement of a corn head row unit as set forth in claim 70 wherein said exposed fluted area is greater than seventeen inches.
72. (Cancelled) The improved arrangement of a corn head row unit as set forth in claim 63 wherein the size of said gathering chain drive sprocket size has been selected to decrease the linear horizontal speed of said plurality of paddles.
73. (Cancelled) The improved arrangement of a corn head row unit as set forth in claim 72 wherein said gathering chain drive sprocket has less than eight teeth and said coast sprocket has eight or more teeth.
74. (Cancelled) The improved arrangement of a corn head row unit as set forth in claim 72 wherein said gathering chain drive sprocket has less than ten teeth and said coast sprocket has eight or more teeth.
75. (Cancelled) The improved arrangement of a corn head row unit as set forth in claim 63 wherein said diameter of said two opposing stalk rolls has been selected to be in the range of three and one half to five inches.
76. (Cancelled) The improved arrangement of a corn head row unit as set forth in claim 63 wherein said distance said at least one flute radially extends from each of said opposing stalk rolls has been selected to be in the range of one-sixteenth of an inch to two inches.
77. (Cancelled) An improved arrangement of a corn head row unit as set forth in claim 62 wherein said corn head row unit has a shear point with a rounded edge.
78. (Cancelled) An improved arrangement of a corn head row unit as set forth in claim 63 wherein said corn head row unit has a shear point with a rounded edge.

79. (Cancelled) The improved arrangement of a corn head row unit as set forth in claim 77 wherein said shear point is removable allowing for replacement.
80. (Cancelled) The improved arrangement of a corn head row unit as set forth in claim 78 wherein said shear point is removable allowing for replacement.
81. (Cancelled) The improved arrangement of a corn head row unit as set forth in claim 62 wherein internal gearing of said gear box has been selected to decrease the linear horizontal speed of said plurality of paddles with respect to said ear separation vertical velocity.
82. (Cancelled) The improved arrangement of a corn head row unit as set forth in claim 63 wherein internal gearing of said gear box has been selected to decrease the linear horizontal speed of said plurality paddles with respect to said ear separation vertical velocity.
83. (Cancelled) The improved arrangement of a corn head row unit as set forth in claim 62 wherein the internal gearing of said gear box, distance said at least one flute radially extends from said at least one stalk roll, said diameter of said at least one stalk roll, the length of said exposed fluted area, and the size of said gathering chain drive sprocket are manipulated alone or in conjunction so that at least one stalk roll is capable of consuming at least sixty inches of a corn plant stalk during the travel of one of said plurality of paddles along said exposed fluted area.
84. (Cancelled) The improved arrangement of a corn head row unit as set forth in claim 63 wherein the internal gearing of said gear box, distance said at least one flute radially extends from said two opposing stalk rolls, said diameter of each of said two opposing stalk rolls, the length of said exposed fluted area, and the size of said gathering chain drive sprocket are manipulated alone or in conjunction so that said two opposing stalk rolls are capable of



consuming at least sixty inches of a corn plant stalk during the travel of one of said plurality of paddles along said exposed fluted area.

85. (Cancelled) An improved arrangement of a corn head row unit comprising:

- g. an engaging means for engaging a corn plant with a plurality of rotational elements;
- h. a pinching means for pinching said corn plant between said plurality of rotational elements;
- i. a pulling means for pulling said corn plant down with said plurality of rotational elements;
- j. a separation means for separating an ear of corn from said corn plant, wherein the rate at which said corn plant is vertically (with respect to the corn head row unit) consumed by said plurality of rotational elements is between 6 and 13 miles per hour for minimal damage to said ear of corn upon impact with said separation means;
- k. a horizontal movement means for engaging said ear of corn for horizontal (with respect to said corn head row unit) movement to an ear collection means and further processing within the threshing unit of a harvesting processor;
- l. a power source for said engaging means, pinching means, pulling means and horizontal movement means wherein the relative speed of said engaging means, pinching means, pulling means and horizontal movement means is fixed during operation; and,
- m. wherein said pinching means, pulling means, horizontal movement means, plurality of rotational elements, and said power source are arranged so that said pulling means is capable of moving sixty inches of a corn plant stalk through said separation means prior to said horizontal movement means traveling the length of said pinching means.

86. (Cancelled) An improved arrangement of a corn head row unit comprising:

- a. a source of power for rotation;
- b. at least one stalk roll for engagement with a corn plant stalk;
- c. at least one flute affixed to said at least one stalk roll wherein said at least one flute protrudes radially from said at least one stalk roll and extends along an axial portion of said at least one stalk roll, and wherein said axial portion of said at least stalk roll from which said at least one flute extends is defined as an exposed fluted area;
- d. at least one stripper plate arranged above said at least one stalk roll;
- e. at least one gathering chain having a plurality of paddles affixed thereto, wherein said at least one gathering chain cooperates with a first and second sprocket and wherein said first sprocket is a drive sprocket and said second sprocket is a coast sprocket;
- f. a gearbox fixing the rotational speed of said gathering chain drive sprocket and the rotational speed of said at least one stalk roll during operation, wherein a rate at which said corn plant stalk is vertically (with respect to said corn head row unit) consumed by said at least one stalk roll is defined as the ear separation vertical velocity, wherein said resulting ear separation vertical velocity is selected from 6 to 13 miles per hour for minimal damage to an ear of corn upon impact with said at least one stripper plate; and,
- g. wherein a distance said at least one flute radially extends from said at least one stalk roll, a diameter of said at least one stalk roll, a size of said gathering chain drive sprocket, said gearbox, and the length of said exposed fluted area are chosen so that at least one stalk roll is capable of consuming at least sixty-five inches of a corn plant stalk during the travel of one of said plurality of paddles along said exposed fluted area.

87. (New) A corn head row unit comprising:

- a. a drive shaft:

- b. a gearbox cooperatively engaged with said drive shaft;
- c. a first stalk roll, wherein said first stalk roll is cooperatively engaged with said gearbox, wherein said first stalk roll is cantilevered with respect to said corn head row unit, and wherein the diameter of said first stalk roll is at least 4 inches;
- d. a second stalk roll, wherein said second stalk roll is cooperatively engaged with said gearbox, wherein said second stalk roll is cantilevered with respect to said corn head row unit, and wherein the diameter of said second stalk roll is at least 4 inches;
- e. a gathering chain drive sprocket, wherein said drive sprocket is cooperatively engaged with said gearbox, and wherein said drive sprocket has 8 teeth affixed thereto;
- f. a gathering chain coast sprocket, wherein said coast sprocket has 8 teeth affixed thereto;
- g. a gathering chain, wherein said gathering chain is cooperatively engaged with said drive sprocket and said coast sprocket, wherein drive sprocket causes said gathering chain to move;
- h. a plurality of paddles affixed to said gathering chain;
- i. two opposing stripper plates arranged below said first and second stalk rolls;
- j. at least one flute affixed to said first stalk roll, wherein said flute extends axially along the length of said first stalk roll, and wherein the distance said flute extends axially along the length of said opposing stripper plates is defined as the exposed fluted area;
- k. at least one flute affixed to said second stalk roll, wherein said flute extends axially along the length of said second stalk roll, wherein the distance said flute extends axially along the length of said opposing stripper plates is defined as the exposed fluted area, and wherein said exposed fluted area on both said first and second stalk rolls is between 15 and 18 inches; and

- l. wherein the ratio of the speed said gearbox causes said first and second stalk rolls to rotate with respect to the speed said drive sprocket rotates is selected so that said first and second stalk rolls are capable of consuming at least 56 inches of a corn plant stalk during the travel of one of said plurality of paddles along said exposed fluted area.

88. (New) A corn head row unit comprising:

- a. a drive shaft;
- b. a gearbox cooperatively engaged with said drive shaft;
- c. a first stalk roll, wherein said first stalk roll is cooperatively engaged with said gearbox, wherein said first stalk roll is cantilevered with respect to said corn head row unit, and wherein the diameter of said first stalk roll is at least 4 inches;
- d. a second stalk roll, wherein said second stalk roll is cooperatively engaged with said gearbox, wherein said second stalk roll is cantilevered with respect to said corn head row unit, and wherein the diameter of said second stalk roll is at least 4 inches;
- e. a drive sprocket, wherein said drive sprocket is cooperatively engaged with said gearbox, and wherein said drive sprocket has 6 teeth affixed thereto;
- f. a coast sprocket, wherein said coast sprocket has 9 teeth affixed thereto;
- g. a gathering chain, wherein said gathering chain is cooperatively engaged with said drive sprocket and said coast sprocket, wherein drive sprocket causes said gathering chain to move;
- h. a plurality of paddles affixed to said gathering chain;
- i. two opposing stripper plates arranged below said first and second stalk rolls;

- j. at least one flute affixed to said first stalk roll, wherein said flute extends axially along the length of said first stalk roll, and wherein the distance said flute extends axially along the length of said opposing stripper plates is defined as the exposed fluted area;
  - k. at least one flute affixed to said second stalk roll, wherein said flute extends axially along the length of said second stalk roll, wherein the distance said flute extends axially along the length of said opposing stripper plates is defined as the exposed fluted area, and wherein said exposed fluted area on both said first and second stalk rolls is between 15 and 22 inches; and
  - l. wherein the ratio of the speed said gearbox causes said first and second stalk rolls to rotate with respect to the speed said drive sprocket rotates is selected so that said first and second stalk rolls are capable of consuming at least 48 inches of a corn plant stalk during the travel of one of said plurality of paddles along said exposed fluted area.
89. (New) A corn head row unit comprising:
- a. a drive shaft;
  - b. a gearbox cooperatively engaged with said drive shaft;
  - c. a first stalk roll, wherein said first stalk roll is cooperatively engaged with said gearbox, wherein said first stalk roll is cantilevered with respect to said corn head row unit, and wherein the diameter of said first stalk roll is at least 3.75 inches;
  - d. a second stalk roll, wherein said second stalk roll is cooperatively engaged with said gearbox, wherein said second stalk roll is cantilevered with respect to said corn head row unit, and wherein the diameter of said second stalk roll is at least 3.75 inches;
  - e. a drive sprocket, wherein said drive sprocket is cooperatively engaged with said gearbox, and wherein said drive sprocket has a plurality of teeth affixed thereto;

- f. a coast sprocket, wherein said coast sprocket has a plurality of teeth affixed thereto;
- g. a gathering chain, wherein said gathering chain is cooperatively engaged with said drive sprocket and said coast sprocket, wherein drive sprocket causes said gathering chain to move;
- h. a plurality of paddles affixed to said gathering chain;
- i. two opposing stripper plates arranged below said first and second stalk rolls;
- j. at least one flute affixed to said first stalk roll, wherein said flute extends axially along the length of said first stalk roll, and wherein the distance said flute extends axially along the length of said opposing stripper plates is defined as the exposed fluted area;
- k. at least one flute affixed to said second stalk roll, wherein said flute extends axially along the length of said second stalk roll, wherein the distance said flute extends axially along the length of said opposing stripper plates is defined as the exposed fluted area, and wherein said exposed fluted area on both said first and said second stalk rolls is between 17 and 22 inches; and
- l. wherein the ratio of the speed said gearbox causes said first and second stalk rolls to rotate with respect to the speed said drive sprocket rotates, and the number of teeth in said plurality of teeth affixed to said drive sprocket are selected so that said first and second stalk rolls are capable of consuming at least 61 inches of a corn plant stalk during the travel of one of said plurality of paddles along said exposed fluted area.